PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A61K 7/50, 7/06 — A1

(11) International Publication Number: WO 98/22088

(43) International Publication Date: 28 May 1998 (28.05.98)

(21) International Application Number: PCT/JP97/03775

(22) International Filing Date: 20 October 1997 (20.10.97)

(30) Priority Data:
8/308243 19 November 1996 (19.11.96) JP
9/18829 31 January 1997 (31.01.97) JP

(71) Applicant *(for all designated States except US)*: KAO CORPORATION [JP/JP]; 14–10, Nihonbashikayabacho 1–chome, Chuo–ku, Tokyo 103 (JP).

(72) Inventors; and

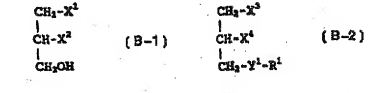
(75) Inventors/Applicants *(for US only)*: HIROTA, Osamu [JP/JP]; Kao Corporation, Research Laboratories, 1–3, Bunka 2–chome, Sumida–ku, Tokyo 131 (JP). OKAMOTO, Yoshimasa [JP/JP]; Kao Corporation, Research Laboratories, 1–3, Bunka 2–chome, Sumida–ku, Tokyo 131 (JP). ONO, Yuko [JP/JP]; Kao Corporation, Research Laboratories, 1–3, Bunka 2–chome, Sumida–ku, Tokyo 131 (JP). KASUGA, Kenichi [JP/JP]; Kao Corporation, Research Laboratories, 1–3, Bunka 2–chome, Sumida–ku, Tokyo 131 (JP). NAKASHIMADA, Atsushi [JP/JP]; Kao Corporation, Research Laboratories, 1–3, Bunka 2–chome, Sumida–ku, Tokyo 131 (JP).

(74) Agents: ARUGA, Mitsuyuki et al.; Kyodo Building, 3–6, Nihonbashiningyocho 1–chome, Chuo–ku, Tokyo 103 (JP).

(81) Designated States: CN, ID, US, VN, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.

(54) Title: SHAMPOO COMPOSITION



(B–1) (B–2)

(57) Abstract

The invention relates to a shampoo composition comprising (A) an anionic surfactant, and (B) a glyceride component containing compounds (B–1) and (B–2) at a weight ratio of 100:0 to 30:70 wherein X^1, X^2, X^3 and X^4 are such that one of X^1 and X^2, or one of X^3 and X^4 is OH, and the other is $-Y^1-R^2$ (in which Y^1 is O or $-O-C(=O)-$, and R^2 is a hydrocarbon group having 8–22 carbon atoms), Y^1 is O or $-O-C(=O)-$, and R^1 is a hydrocarbon group having 8–22 carbon atoms, wherein the composition has a viscosity of at least 2,000 cp at 30 °C, exhibits an appearance of a translucent or white emulsion, and has an average droplet size of 0.5–200 μm when diluted into an emulsion. The composition is excellent in the feel of foams produced and conditioning effects, to say nothing of detergency, and is also good in emulsion stability.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

DESCRIPTION

SHAMPOO COMPOSITION

TECHNICAL FIELD

The present invention relates to (hair) shampoo compositions, and more particularly to shampoo compositions which have excellent conditioning effects and produce foams having a pleasant feel.

BACKGROUND ART

In shampoo compositions, a surfactant typified by an anionic surfactant is incorporated as a detergent component. In recent years, various conditioning components, for example, oily components, have been incorporated in addition to the anionic surfactant with a view toward imparting moisture to hair during and after shampooing, making the hair smoothly slidable and protecting the hair.

However, a shampoo composition in which an oily component is incorporated involves problems that its foamability is lowered, foams produced have an unpleasant feel, and the detergency is also insufficient. For example, a shampoo composition in which a triglyceride is incorporated has involved a drawback that not only foamability is lowered, but also the viscosity of the composition is reduced, and an emulsion system is

unstable.

Accordingly, it is an object of the present invention to provide shampoo compositions having excellent conditioning effects, to say nothing of excellent detergency, produce foams having a pleasant feel and form a stable emulsion system.

DISCLOSURE OF THE INVENTION

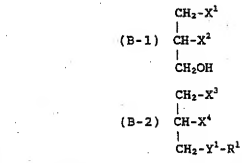
The present inventors have carried out an investigation as to combinations of an oily substance and an anionic surfactant in an extremely wide range with a view toward achieving the above object. As a result, it has been found that when an anionic surfactant is combined with a monoglyceride or a mixture containing a monoglyceride and a diglyceride at a certain ratio in such a manner that the viscosity of the resulting composition and the droplet size of an emulsion obtained by dilution fall within certain ranges, a shampoo composition, which has excellent detergency and conditioning effects, produces foams having a pleasant feel and forms a stable emulsion system, can be provided, thus leading to completion of the present invention.

According to the present invention, there is thus provided a shampoo composition comprising the following components (A) and (B):

(A) an anionic surfactant; and

(B) a glyceride component containing the following

compounds (B-1) and (B-2) at a weight ratio of 100:0 to 30:70:



wherein X^1, X^2, X^3 and X^4 are such that one of X^1 and X^2, or one of X^3 and X^4 is a hydroxyl group, and the other is $-Y^2-R^2$ (in which Y^2 is an oxygen atom or -O-C(=O)-, and R^2 is a hydrocarbon group having 8-22 carbon atoms), Y^1 is an oxygen atom or -O-C(=O)-, and R^1 is a hydrocarbon group having 8-22 carbon atoms,
wherein the composition has a viscosity of at least 2,000 cp at 30°C, exhibits an appearance of a translucent or white emulsion, and has an average droplet size of 0.5-200 μm when diluted into an emulsion.

BEST MODE FOR CARRYING OUT THE INVENTION

No particular limitation is imposed on the anionic surfactant of the component (A) used in the present invention so far as it is that commonly incorporated as a detergent component in the classical shampoo compositions. Examples thereof include the following anionic surfactants (i) to (xi):
(i) alkylbenzenesulfonates, preferably, linear or

branched alkylbenzenesulfonates having an alkyl group having 10-16 carbon atoms on the average;
(ii) alkyl ether sulfates or alkenyl ether sulfates, preferably, alkyl ether sulfates or alkenyl ether sulfates having a linear or branched alkyl or alkenyl group having 10-20 carbon atoms on the average, to which ethylene oxide, propylene oxide, butylene oxide, or ethylene oxide and propylene oxide at a ratio of 0.1/9.9 to 9.9/0.1 or ethylene oxide and butylene oxide at a ratio of 0.1/9.9 to 9.9/0.1 are added in a proportion of 0.5-8 mol on the average per molecule;
(iii) alkylsulfates or alkenylsulfates, preferably, alkylsulfates or alkenylsulfates having an alkyl or alkenyl group having 10-20 carbon atoms on the average;
(iv) olefinsulfonates, preferably, olefinsulfonates having 10-20 carbon atoms on the average per molecule;
(v) alkanesulfonates, preferably, alkanesulfonates having 10-20 carbon atoms on the average per molecule;
(vi) higher fatty acid salts, preferably, saturated or unsaturated fatty acid salts having 10-24 carbon atoms on the average per molecule;
(vii) amidoether carboxylic acid type surfactants, preferably, amidoether carboxylic acid type surfactants represented by the following formula:

$$R^3\text{-}(OC_3H_6)_p\text{-}(OC_2H_4)_n\text{-}OCH_2\text{-}COOA$$

wherein R^3 is a linear or branched alkyl or alkenyl group having 8-22 carbon atoms, C_{8-22}-alkylphenyl or $R^4CONH\text{-}CH_2$-

CH_2- in which R^4 is a linear or branched alkyl or alkenyl group having 11-21 carbon atoms, n is a number of 2-24, p is a number of 0-6, and A is a hydrogen atom, sodium, potassium, lithium, magnesium, a residue of monoethanolamine, ammonium or a residue of triethanolamine;

(viii) α-sulfo-fatty acid salts or esters, preferably, α-sulfo-fatty acid salts or esters having an alkyl or alkenyl group having 10-20 carbon atoms on the average;

(ix) N-acylamino acid type surfactants, preferably, N-acylamino acid type surfactants having an acyl group having 8-24 carbon atoms and a free carboxylic acid residue;

(x) phosphate type surfactants, preferably, mono- or diphosphate type surfactants having an alkyl or alkenyl group having 8-24 carbon atoms; and

(xi) sulfosuccinate type surfactants, preferably, the sulfosuccinates of higher alcohols having 8-22 carbon atoms, ethoxylates thereof or the like, or sulfosuccinates derived from higher fatty acid amides.

Examples of counter ions to the anionic residues of these anionic surfactants include ions of alkali metals such as sodium and potassium, ions of alkaline earth metals such as calcium and magnesium, an ammonium ion, and alkanolamines (for example, monoethanolamine, diethanolamine, triethanolamine, triisopropanolamine, etc.) having 1-3 alkanol groups having 2 or 3 carbon

atoms.

Of these anionic surfactants (A), (ii) the alkyl ether sulfates or alkenyl ether sulfates, (iii) the alkylsulfates, (vi) the saturated or unsaturated fatty acid salts, (ix) the acylamino acid type surfactants, (x) the monophosphate type surfactants and (xi) the sulfosuccinates are preferred, with (ii) the alkyl ether sulfates or alkenyl ether sulfates being particularly preferred.

The anionic surfactants of the component (A) may be used either singly or in any combination thereof, and are preferably incorporated in a proportion of 1-40 wt.% (hereinafter indicated merely by "%"), more preferably 2-30%, most preferably 3-20%, based on the total weight of the shampoo composition from the viewpoints of detergency and foamability.

The glyceride of the component (B) is a monoglyceryl ester or monoglyceryl ether represented by the formula (B-1), or a mixture of the monoglyceryl ester or monoglyceryl ether represented by the formula (B-1) and a diglyceryl ester or diglyceryl ether represented by the formula (B-2), in which the mixture contains the compound (B-1) in a proportion of at least 30%. If the content of the compound (B-1) in this mixture is lower than 30%, the viscosity of the resultant composition is reduced, and the foamability of the composition becomes insufficient. Incidentally, the compound (B-1) is a

monoglyceryl ester or monoglyceryl ether, while the compound (B-2) is a diglyceryl ester or diglyceryl ether.

In the formulae (B-1) and (B-2), Y^1 and Y^2 are preferably -O-C(=O)-, namely, the compounds (B-1) and (B-2) are preferably glyceryl esters. The hydrocarbon groups having 2-22 carbon atoms, which are represented by R^1 and R^2, are preferably alkyl or alkenyl groups having 8-22 carbon atoms. These groups R^1 and R^2 are preferably combinations of hydrocarbon groups derived from at least two fatty acids, not hydrocarbon groups derived from one fatty acid. For example, a mixture of a glyceride (B) in which R^1 and R^2 are alkyl or alkenyl groups having 8-14 carbon atoms and a glyceride (B) in which R^1 and R^2 are alkyl or alkenyl groups having 16-22 carbon atoms is particularly preferably used.

The component (B) is preferably incorporated in a proportion of 0.5-20%, more preferably 1-15%, most preferably 3-10%, based on the total weight of the shampoo composition from the viewpoints of foamability and conditioning effects.

In the shampoo compositions according to the present invention, a silicone derivative (C) may be further incorporated. The incorporation of the silicone derivative permits improvement in the slidability of hair during and after shampooing. Examples of such a silicone derivative include dimethyl polysiloxane, methylphenyl polysiloxane, amino-modified silicones, polyether-

modified silicones, fatty acid-modified silicones, fluorine-modified silicones, cyclic silicones, alkyl-modified silicones, alcohol-modified silicones, aliphatic alcohol-modified silicones and epoxy-modified silicones.

Of these silicone derivatives, those having a viscosity of 1 cs to 1 x 10^8 cs, particularly 10 cs to 5 x 10^7 cs are preferred.

The silicone derivative may be used either singly or in any combination thereof. The silicone derivatives are preferably incorporated in a proportion of 0.1-15%, particularly 0.5-10%, based on the total weight of the shampoo composition.

In the shampoo compositions according to the present invention, a water-soluble polymer (D) may be further incorporated with a view toward improving the slidability and feel of hair. As the water-soluble polymer, any of natural, semisynthetic and synthetic polymers may be used. Besides, any of cationic, anionic and nonionic polymers may also be used.

Examples of the natural water-soluble polymers include vegetable polymers such as gum arabic, tragacanth gum, galactan, guar gum, carob gum, karaya gum, carrageenan, pectin, agar, quince seed (marmelo) and glycyrrhetinic acid; microbial polymers such as xanthan gum, dextran, succinoglucan and pullulan; and protein hydrolyzate type polymers such as cleavage derivatives from keratinous substances.

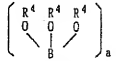
Examples of the semisynthetic water-soluble polymers include starch type polymers such as cationic starch, carboxymethyl starch and methylhydroxypropyl starch; cellulosic polymers such as cationized cellulose derivatives, methyl cellulose, nitrocellulose, ethyl cellulose, methylhydroxypropyl cellulose, hydroxyethyl cellulose, sodium cellulose sulfate, hydroxypropyl cellulose, sodium carboxymethyl cellulose (CMC), crystalline cellulose and cellulose powder; alginate type polymers such as sodium alginate and propylene glycol alginate; and cationized guar gum derivatives.

Examples of the synthetic water-soluble polymers include homopolymers of diallyl quaternary ammonium salts; diallyl quaternary ammonium salt/acrylamide copolymers; quaternized polyvinyl pyrrolidone derivatives; polyvinyl pyrrolidone; copolymers of vinylpyrrolidone with vinyl acetate, alkyl aminoacrylate or the like; lower alkyl half esters of copolymers of methyl vinyl ether with maleic anhydride; copolymers of vinyl acetate with crotonic acid or the like; copolymers of acrylic acid and/or methacrylic acid with alkyl acrylate and/or alkyl methacrylate; terpolymers of acrylic acid, alkyl acrylate and N-alkylacrylamide; amphoterized products of copolymers of dialkylaminoethyl methacrylate, dialkylaminoethyl acrylate, diacetoneacrylamide or the like with acrylic acid, methacrylic acid, alkyl acrylate, alkyl methacrylate or

the like; terpolymers of hydroxypropyl acrylate, butylaminoethyl methacrylate and acrylic octylamide; and tetrapolymers of alkylacrylamide, acrylate, alkylaminoalkylacrylamide and polyethylene glycol methacrylate.

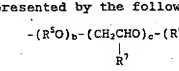
Of these water-soluble polymers, the water-soluble cationic polymers containing an amino group or ammonium group bonded to polymer chains thereof, or at least containing a dimethyldiallylammonium halide as a structural unit are preferred. Examples thereof include the cationized cellulose derivatives, cationic starch, cationized guar gum derivatives, homopolymers of diallyl quaternary ammonium salts, diallyl quaternary ammonium salt/acrylamide copolymers and quaternized polyvinyl pyrrolidone derivatives.

The cationized cellulose derivatives are preferably those represented by the following general formula (1):



(1)

wherein B is a residue of an anhydroglucose unit, a is an integer of 50-20,000, and each R^4 is a substituent group represented by the following general formula (2):



(2)

wherein R^5 and R^6 are independently an alkylene group having 2 or 3 carbon atoms, b is an integer of 0-10, c is an integer of 0-3, d is an integer of 0-10, R^7 is an alkylene or hydroxyalkylene group having 1-3 carbon atoms, R^8, R^9 and R^{10} are the same or different from one another and are independently an alkyl, aryl or aralkyl group having at most 10 carbon atoms, or may form a heterocyclic ring together with the nitrogen atom in the formula, and X is an anion (chloride, bromide, iodide, sulfate, sulfonate, methylsulfate, phosphate, nitrate or the like).

The degree of substitution of the cations in the cationized cellulose is 0.01-1. Namely, the average value of c per anhydroglucose unit is 0.01-1, preferably 0.02-0.5. The sum of b + d is 1-3 on the average. Any degree of substitution lower than 0.01 is insufficient. On the other hand, the degree of substitution may be higher than 1. However, it is preferably 1 or lower from the viewpoint of reaction yield. For example, those in which R^8, R^9 and R^{10} are all CH_3 groups, or two of them are short-chain alkyl groups such as CH_3 groups, and the remainder is a long-chain alkyl group having 10-20 carbon atoms are preferred. The molecular weight of the cationized cellulose used herein is about 100,000-8,000,000.

The cationic starch is preferably that represented by the following general formula (3):

$$D\text{-}[O\text{-}R^{10}\text{-}N^{\oplus}(R^{11})(R^{13})\text{-}R^{12}\cdot X^{\ominus}]_e \qquad (3)$$

wherein D is a residue of starch, R^{10} is an alkylene or hydroxyalkylene group, R^{11}, R^{12} and R^{13} are the same or different from one another and are independently an alkyl, aryl or aralkyl group having at most 10 carbon atoms, or may form a heterocyclic ring together with the nitrogen atom in the formula, X has the same meaning as defined above, and e is a positive integer.

The degree of substitution of the cations in the cationic starch is 0.01-1. Namely, the cationic groups are preferably introduced in a proportion of 0.01-1 group, particularly 0.02-0.5 groups per anhydroglucose unit. Any degree of substitution lower than 0.01 is insufficient. On the other hand, the degree of substitution may be higher than 1. However, it is preferably 1 or lower from the viewpoint of reaction yield.

The cationized guar gum derivatives are preferably those represented by the following general formula (4):

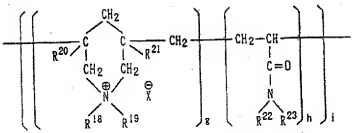
$$E\text{-}[O\text{-}R^{14}\text{-}N^{\oplus}(R^{15})(R^{17})\text{-}R^{16}\cdot X^{\ominus}]_f \qquad (4)$$

wherein E is a residue of guar gum, R^{14} is an alkylene or hydroxyalkylene group, R^{15}, R^{16} and R^{17} are the same or different from one another and are independently an alkyl,

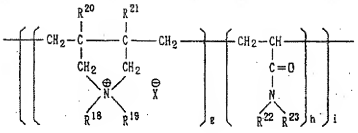
aryl or aralkyl group having at most 10 carbon atoms, or may form a heterocyclic ring together with the nitrogen atom in the formula, X has the same meaning as defined above, and f is a positive integer.

The degree of substitution of the cations in the cationized guar gum derivatives is preferably 0.01-1, namely, the cationic groups are preferably introduced in a proportion of 0.01-1 group, more preferably 0.02-0.5 group per sugar unit. Cationic polymers of this type are described in Japanese Patent Publication Nos. 35640/1983 and 46158/1985 and Japanese Patent Application Laid-Open No. 53996/1983, and are commercially available, for example, under the trade mark of Jaguar from Celanese Schtein Hall Co.

The diallyl quaternary ammonium salt polymers or diallyl quaternary ammonium salt/acrylamide copolymers are preferably those represented by the following general formula (5) or (6):



(5)

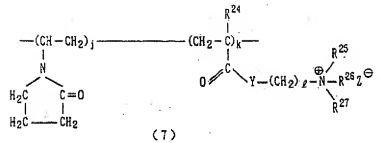


(6)

wherein R^{18} and R^{19} are the same or different from each other and are independently a hydrogen atom, or an alkyl (having 1-18 carbon atoms), phenyl, aryl, hydroxyalkyl, amidoalkyl, cyanoalkyl, alkoxyalkyl or carboalkoxyalkyl group, R^{20}, R^{21}, R^{22} and R^{23} are the same or different from one another and are independently a hydrogen atom, or a lower alkyl (having 1-3 carbon atoms) or phenyl group, X has the same meaning as defined above, g is an integer of 1-50, h is an integer of 0-50, and i is an integer of 150-8,000.

The diallyl quaternary ammonium salt/acrylamide copolymers preferably have a molecular weight within a range of about 30,000-2,000,000, more preferably 100,000-1,000,000.

The quaternized polyvinyl pyrrolidone derivatives are preferably those represented by the following general formula (7):



(7)

wherein R^{24} is a hydrogen atom or an alkyl group having 1-3 carbon atoms, R^{25}, R^{26} and R^{27} are the same or different from one another and are independently a hydrogen atom, or an alkyl, hydroxyalkyl, amidoalkyl, cyanoalkyl, alkoxyalkyl or carboalkoxyalkyl having 1-4 carbon atoms, Y is an oxygen atom or an NH group in an amide bond, Z is an anion (chloride, bromide, iodide, sulfate, sulfonate, alkylsulfate having 1-4 carbon atoms, phosphate, nitrate or the like), l is an integer of 1-10, j + k is an integer of 20-8,000.

The quaternized polyvinyl pyrrolidone derivatives preferably have a molecular weight within a range of 10,000-2,000,000, more preferably 50,000-1,500,000. The content of the cationic nitrogen derived from the cationic polymer contained in each of the above-described vinyl polymers is 0.004-0.2%, preferably 0.01-0.15%, based on the vinyl polymer. Any content of the cationic nitrogen lower than 0.004% is insufficient to bring about a sufficient effect. On the other hand, any content exceeding 0.2% may be preferable from the viewpoint of performance, but forms the cause of discoloration of the

vinyl polymer and is also economically disadvantageous.

Of these cationic polymers, the cationized cellulose, diallyl quaternary ammonium salt polymers and diallyl quaternary ammonium salt/acrylamide copolymers are particularly preferred.

The water-soluble polymers (D) may be used either singly or in any combination thereof and are preferably incorporated in a proportion of 0.05-3%, particularly 0.1-1.5%, based on the total weight of the shampoo composition.

Further, to the shampoo compositions according to the present invention, other ingredients commonly used in the classical shampoo compositions, for example, water; amphoteric surfactants such as betaine type surfactants; nonionic surfactants; moisturizers such as propylene glycol, glycerol, glucose and diethylene glycol monoethyl ether; viscosity modifiers such as ethanol; perfume bases; colorants; ultraviolet absorbents; antioxidants; antibacterial agents; and antiseptics such as methylparaben and butylparaben, may be suitably added in addition to the above-described components so far as no detrimental influence is thereby imposed on the effects of the present invention.

The shampoo compositions according to the present invention can be prepared by mixing and stirring the above components at room temperature or with heating as needed, in such a manner that the resulting composition

has a viscosity of at least 2,000 cp at 30°C, exhibits an appearance of a translucent or white emulsion, and has an average droplet size of 0.5-200 μm when diluted into an emulsion.

In the present invention, the viscosity is that measured by means of a Brookfield type viscometer. Any viscosity lower than 2,000 cp at 30°C is not preferable because the stability of the resulting composition is lowered. It is preferable to control the viscosity to 2,000-100,000 cp, particularly 2,000-50,000 cp.

The average droplet size of the emulsion when diluted is determined by diluting the composition (oil-in-water type) until an emulsion having a fixed droplet size is formed, and measuring the droplet size of oil droplets forming the emulsion by means of a laser diffraction/scattering particle size distribution meter. If the average droplet size of the emulsion is smaller than 0.5 μm, the conditioning effects by the component (B) is not sufficiently brought about. If the average droplet size exceeds 200 μm, the emulsion system becomes unstable. Therefore, the droplet size is preferably 0.5-200 μm, particularly, 1-100 μm.

Upon the preparation of the compositions according to the present invention, they may be adjusted to pH 4-11 with a basic or acid chemical as needed.

EXAMPLES

The present invention will hereinafter be described in detail by the following Examples. However, the present invention is not limited to and by these examples.

Example 1:

Shampoo compositions having their corresponding formulations shown in Table 1 were prepared to evaluate the compositions as to appearance·physical properties, foamability, and conditioning effects (feel of hair upon foaming and rinsing, and after drying the hair).

(1) Evaluation methods:

a. Appearance·physical properties:

With respect to each of the shampoo compositions prepared above, the viscosity at 30°C, appearance and average droplet size of an emulsion when diluted were determined.

Incidentally, the viscosity was measured by means of a Brookfield type viscometer. The appearance was visually judged and ranked as ○ where the composition exhibited a translucent or white emulsion, or × where the composition exhibited anything else. The average droplet size of the emulsion was measured by means of a laser diffraction/scattering particle size distribution meter, LA-910, and an automatic dilution unit, LY-101 (both, manufactured by Horiba Ltd.) after the composition was diluted with water.

b. Conditioning effects:

Each 20 g (15 cm long) of the hair of Japanese

women, which had been subjected to permanent waving, was shampooed with 1 g of each of the shampoo compositions to evaluate the hair cosmetic composition as to the feel of the hair upon foaming and rinsing, and after drying the hair by an expert panel in accordance with the following standard:

○: pleasant;

△: not very pleasant; and

×: unpleasant.

(2) Results:

As a result, as shown in Table 1, the shampoo compositions according to the present invention produced foams having a pleasant feel and had good conditioning effects. They also had good emulsion stability.

Table 1

Components (%)	Invention product				Comparative product		
	1	2	3	4	1	2	3
Sodium polyoxyethylene (3) lauryl ether sulfate	10	10	10	10	10	10	10
Lauric acid amide propyldimethylamino-acetic acid betaine	5	5	5	5	5	5	5
Diethanolamide laurate	3	3	3	3	3	3	3
Lauric acid monoglyceride (monoglyceride content: at least 80%)	9	-	-	-	-	1	-
Lauric acid mono- and diglyceride (monoglyceride content: about 50%)	-	9	-	-	-	-	-
Oleic acid monoglyceride (monoglyceride content: at least 90%)	-	-	9	-	-	-	-
Oleic acid mono- and diglyceride (monoglyceride content: about 50%)	-	-	-	9	-	-	-
Oleic acid triglyceride	-	-	-	-	-	-	9
Water	Balance	Balance	Balance	Balance	Balance	Balance	Balance
Viscosity (cp)	9,200	6,000	4,000	2,600	14,000	26,000	10,000
Appearance · physical properties	○	○	○	○	×	×	○
Average particle size of emulsion when diluted (μm)	1	1	1.5	2	-	-	5
Feel upon foaming	○	○	○	○	×	△	△
Feel upon rinsing	○	○	○	○	×	×	△
Feel after drying	○	○	○	○	×	×	△

Example 2:

Shampoo compositions having their corresponding formulations shown in Tables 2 and 3 were prepared. All the shampoo compositions thus obtained had a viscosity of at least 2,000 cp at 30°C, exhibited an appearance of a translucent or white emulsion, and had an average droplet size of 0.5-200 μm when diluted into emulsions. Their conditioning effects were evaluated in the same manner as in Example 1. As a result, the compositions were found to be excellent in both feel of foams and conditioning effects. They also had good emulsion stability.

Table 2

Components (%)	Invention product				
	5	6	7	8	9
Sodium polyoxyethylene (3) lauryl ether sulfate	12	8	1	8	12
Lauric acid amide propyldimethylaminoacetic acid betaine	5	5	3	-	5
Laurylhydroxysulfobetaine	-	-	2	2	-
Lauryldimethylamine oxide	-	2	-	2	1
2-Alkyl-N-carboxymethyl-N-hydroxyethyl-imidazolinium betaine	-	3	5	2	-
Coconut oil fatty acid diethanolamide	4	3	2	3	3
Lauryldimethylaminoacetic acid betaine	-	-	-	3	-
Disodium polyoxyethylene (3) lauryl sulfosuccinate	-	-	8	-	-
Lauric acid monoglyceride (monoglyceride content: at least 80%)	-	4	4	-	-
Lauric acid mono- and diglyceride (monoglyceride content: about 50%)	4	-	-	4	3
Oleic acid monoglyceride (monoglyceride content: at least 90%)	-	2	-	1	1
Oleic acid mono- and diglyceride (monoglyceride content: about 50%)	-	1	2	-	-
Oleic acid stearic acid mono- and diglyceride (monoglyceride content: about 60%)	3	-	-	3	2
Behenic acid monoglyceride (monoglyceride content: at least 90%)	-	-	1	-	1
Dimethyl polysiloxane (20,000,000 cs/isoparaffin = 40/60)	3	3	-	3	-
Dimethyl polysiloxane (20,000,000 cs/300 cs = 30/70)	-	-	3	-	-
Amodimethicone (SM8702C, product of Dow Corning Toray Silicone Co., Ltd.)	3	3	-	3	-
Polyether-modified silicone (KF351A, product of Shin-Etsu Silicone Co., Ltd.)	-	-	3	-	-
Guar gum (Guar Pack HP20, product of Dainippon Pharmaceutical Co., Ltd.)	-	0.2	-	-	-
Xanthan gum (Echo Gum T, product of Dainippon Pharmaceutical Co., Ltd.)	-	0.2	-	-	-
Cationized cellulose (Catinal HC200, product of Toho Chemical Industry Co., Ltd.)	-	-	-	0.3	-
Cationic polymer (Merquat 100, product of Calgon Corp.)	-	-	0.1	-	-
Cationic polymer (Merquat 550, product of Calgon Corp.)	0.5	-	0.3	-	0.5
Cationized guar gum (Laboru Gum CGM, product of Dainippon Pharmaceutical Co., Ltd.)	-	-	-	0.1	-
Ethylene glycol monostearate	-	-	-	-	-
Ethylene glycol distearate	-	-	-	-	-
Perfume base, colorant	q.s.	q.s.	q.s.	q.s.	q.s.
pH adjustor (adjusted to pH 4-11)	q.s.	q.s.	q.s.	q.6.	q.s.
Water	Bal.	Bal.	Bal.	Bal.	Bal.

Table 3

Components (%)	Invention product				
	10	11	12	13	14
Sodium polyoxyethylene (3) lauryl ether sulfate	12	12	12	12	12
Lauric acid amide propyldimethylaminoacetic acid betaine	5	5	5	5	5
Laurylhydroxysulfobetaine	-	-	-	-	-
Lauryldimethylamine oxide	2	2	2	2	2
2-Alkyl-N-carboxymethyl-N-hydroxyethyl-imidazolinium betaine	-	-	-	-	-
Coconut oil fatty acid diethanolamide	2	2	2	2	2
Lauryldimethylaminoacetic acid betaine	-	-	-	-	-
Disodium polyoxyethylene (3) lauryl sulfosuccinate	-	-	-	-	-
Lauric acid monoglyceride (monoglyceride content: at least 80%)	-	-	2	-	-
Lauric acid mono- and diglyceride (monoglyceride content: about 50%)	3	3	1	4	3
Oleic acid monoglyceride (monoglyceride content: at least 90%)	2	2	1	-	2
Oleic acid mono- and diglyceride (monoglyceride content: about 50%)	2	2	-	-	-
Oleic acid stearic acid mono- and diglyceride (monoglyceride content: about 60%)	-	-	2	3	2
Behenic acid monoglyceride (monoglyceride content: at least 90%)	-	-	-	-	-
Dimethyl polysiloxane (20,000,000 cs/isoparaffin = 40/60)	2	2	2	2	2
Dimethyl polysiloxane (20,000,000 cs/300 cs = 30/70)	1	1	1	1	1
Amodimethicone (SM8702C, product of Dow Corning Toray Silicone Co., Ltd.)	3	3	3	3	3
Polyether-modified silicone (KF351A, product of Shin-Etsu Silicone Co., Ltd.)	-	-	-	-	-
Guar gun (Guar Pack PP20, product of Dainippon Pharmaceutical Co., Ltd.)	-	-	-	-	0.1
Xanthan gum (Echo Gum T, product of Dainippon Pharmaceutical Co., Ltd.)	-	-	-	0.1	-
Cationized cellulose (Catinal HC200, product of Toho Chemical Industry Co., Ltd.)	-	-	-	-	-
Cationic polymer (Merquat 100, product of Calgon Corp.)	-	-	-	-	-
Cationic polymer (Merquat 550, product of Calgon Corp.)	-	0.5	0.5	-	0.3
Cationized guar gum (Laboru Gum CGM, product of Dainippon Pharmaceutical Co., Ltd.)	-	-	-	0.3	-
Ethylene glycol monostearate	-	1	-	1	-
Ethylene glycol distearate	-	-	2	-	2
Perfume base, colorant	q.s.	q.s.	q.s.	q.s.	q.s.
pH adjustor (adjusted to pH 4-11)	q.s.	q.s.	q.s.	q.s.	q.s.
Water	Bal.	Bal.	Bal.	Bal.	Bal.

1.2%Pb

INDUSTRIAL APPLICABILITY

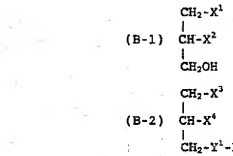
The shampoo compositions according to the present invention are excellent in the feel of foams produced and conditioning effects, to say nothing of detergency, and are also good in emulsion stability.

CLAIMS

1. A shampoo composition comprising the following components (A) and (B):

(A) an anionic surfactant; and

(B) a glyceride component containing the following compounds (B-1) and (B-2) at a weight ratio of 100:0 to 30:70:



wherein X^1, X^2, X^3 and X^4 are such that one of X^1 and X^2, or one of X^3 and X^4 is a hydroxyl group, and the other is $-Y^2-R^2$ (in which Y^2 is an oxygen atom or -O-C(=O)-, and R^2 is a hydrocarbon group having 8-22 carbon atoms), Y^1 is an oxygen atom or -O-C(=O)-, and R^1 is a hydrocarbon group having 8-22 carbon atoms,

wherein the composition has a viscosity of at least 2,000 cp at 30°C, exhibits an appearance of a translucent or white emulsion, and has an average droplet size of 0.5-200 μm when diluted into an emulsion.

2. The shampoo composition according to claim 1, wherein (A) the anionic surfactant is an alkyl ether sulfate or alkenyl ether sulfate.

3. The shampoo composition according to claim 1 or 2, wherein the composition has a viscosity of 2,000-100,000 cp at 30°C.

4. The shampoo composition according to any one of claims 1 to 3, which further comprises (C) a silicone derivative.

5. The shampoo composition according to claim 4, wherein (C) the silicone derivative is at least one selected from the group consisting of dimethyl polysiloxane, methylphenyl polysiloxane, amino-modified silicones, polyether-modified silicones, fatty acid-modified silicones, fluorine-modified silicones, cyclic silicones, alkyl-modified silicones, alcohol-modified silicones, aliphatic alcohol-modified silicones and epoxy-modified silicones.

6. The shampoo composition according to any one of claims 1 to 5, which further comprises (D) a water-soluble polymer.

7. The shampoo composition according to claim 6, wherein (D) the water-soluble polymer is a cationic polymer.

INTERNATIONAL SEARCH REPORT

Inter onal Application No
PCT/JP 97/03775

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61K7/50 A61K7/06

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 41 39 935 A (KAO CORPORATION) 9 June 1993 see page 1, line 35-54 see page 2, line 41-50 see page 3, line 26-30 see claims; examples 1-3	1-3,6,7
X	FR 2 304 393 A (GRUENAU GMBH CHEM FAB) 15 October 1976 see page 3, line 1-32; claims 1-5; examples 1-4	1-3
X	EP 0 521 748 A (OREAL) 7 January 1993 see claims; example 7	1-6

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publicationdate of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 January 1998	10/02/1998
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Authorized officer Veronese, A

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Intern nal Application No
PCT/JP 97/03775

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 330 526 A (WATANABE HIROSHI ET AL) 18 May 1982 see page 2, line 7-63; claims; examples 1,2	1,3
X	EP 0 047 916 A (GOLDSCHMIDT AG TH) 24 March 1982 See compositions of table 1 see claims 1-3	1-3
X	DE 42 36 109 A (HENKEL KGAA) 28 April 1994 See compositions of table 1 see claims	1-3

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Interr nal Application No
PCT/JP 97/03775

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4139935 A	09-06-93	JP 5201853 A	10-08-93
FR 2304393 A	15-10-76	DE 2511600 A	23-09-76
		GB 1537112 A	29-12-78
EP 0521748 A	07-01-93	FR 2677995 A	24-12-92
		AT 137109 T	15-05-96
		AU 667306 B	21-03-96
		AU 1843792 A	24-12-92
		CA 2071801 A	22-12-92
		DE 69210119 D	30-05-96
		DE 69210119 T	19-09-96
		ES 2086686 T	01-07-96
		JP 5179297 A	20-07-93
		US 5650383 A	22-07-97
US 4330526 A	18-05-82	JP 1000165 C	30-05-80
		JP 52114604 A	26-09-77
		JP 54035203 B	01-11-79
		DE 2709400 A	29-09-77
		FR 2345142 A	21-10-77
		GB 1518067 A	19-07-78
EP 0047916 A	24-03-82	DE 3033929 A	18-03-82
		BR 8105370 A	31-08-82
		US 4420410 A	13-12-83
DE 4236109 A	28-04-94	WO 9410274 A	11-05-94